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PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Beverage package and method of manufacture

We, MICHAEL LEHMACHER, of Unterdorfstrasse, Mondorf über Troisdorf, Germany, and HANS LEHMACHER, of Beckergasse, Mondorf über Troisdorf, Germany, both of German nationality, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention is concerned with a beverage packaging bag of synthetic thermoplastic film and a method for manufacturing same. It is an object of the invention to fabricate a beverage package without need of complicated and expensive automatic welding devices. Further, the beverage pack should be prepared in a rapid series of working operations and be able to be filled with liquid in available filling machines.

With the above in view the present invention provides a beverage bag of thermoplastic synthetic plastic film, which is adapted to be emptied by means of a drinking straw, wherein the bag is fabricated starting with a gusseted tube of thermoplastic sheet material, and in which the drinking straw is introduced into the bag between the faces of the gussett, the said faces of the gussett being welded together except of that part which forms an insertion opening through which a drinking straw can be inserted and, extending over the width of the bag, there is an opening through which the bag is filled to be closed by welding after the filling of the bag.

In some embodiments, for closing of the straw entrance, the bag walls and the gussetts may be seamed with a four layer weld at the top end of the bag, or in this region, up to an opening for straw insertion, the opening being preferably in the middle of the bag edge.

In accordance with a characteristic of the invention in its preferred form it is proposed that the gussetts, and accordingly also the bag walls, have unequal widths and, that, at the top end of the narrower wall or in the top region, the two gussetts be seamed only with this narrow wall, up to a straw insertion opening at its preferably central location; that the wide and projecting gussett, for purposes of filling of the bag with liquid, be cut on its line of fold with the wide bag wall, and after bag filling be again united with the latter through a welded seam. Further, the beverage bag is preferably provided with a base.

The invention is further described in detail with additional features with respect to certain embodiments shown in the accompanying drawings. The invention is of course not limited to the embodiments there represented but rather other modifications are possible in the scope of the invention.

In the drawings:

FIGS. 1-3 show a section through a double gusseted tube representing working steps in fabrication of a beverage bag;

FIG. 4 is a plan view of a beverage bag fabricated by the steps represented in FIGS. 1-3;

FIG. 5 is a section through a simple gusseted tube;

FIG. 6 shows the joining of the gussetts of the tube of FIG. 5;

FIG. 7 is a horizontal section taken along the line VII-VII in FIG. 6;

FIG. 8 shows the results of further working on the tube of FIGS. 5 and 6;

FIG. 9 is a plan view of the finished beverage bag after the working step of FIG. 8;

FIG. 10 is an essentially schematic representation, in plan view, of the fabrication of a beverage bag of the particularly pre-

ferred construction form;

FIG. 11 is a perspective view showing the double blades for welding the gussetts alone;

FIG. 12 is a vertical section, enlarged in comparison with FIG. 10, of the right part of the tube, taken along the line on XII-XII in FIG. 10;

FIGS. 13 and 14 each show a vertical section through two webs guided and extending in a horizontal plane for fabricating a bag analogous to a gussetted tube;

FIG. 15 is a vertical section through a gussetted tube extending in a horizontal plane, one longitudinal edge of which projects outwardly beyond the other;

FIG. 16 is a perspective view of a preferred beverage bag construction;

FIG. 17 is a section through a double gussetted tube taken along the line I-I in FIG. 18;

FIG. 18 in plan view shows schematically the fabrication of a beverage bag starting with the double gussetted tube;

FIG. 19 is a front elevational view of the finished bag of FIGS. 17 and 18;

FIG. 20 is a section taken along the line XX-XX of FIG. 19;

FIG. 21 is a section taken along the line XXI-XXI in FIG. 19;

FIG. 22 represents essentially schematically and in top plan another manner of preparation of a beverage bag in accordance with the invention starting from a double gussetted tube;

FIG. 23 is a section taken along the line of XXIII-XXIII in FIG. 22;

FIG. 24 is a section taken along the line XXIV-XXIV in FIG. 22;

FIG. 25 is a section taken along the line XXV-XXV in FIG. 22;

FIG. 26 is a front elevational view of a beverage bag ready for filling, as produced in FIGS. 23-25;

FIG. 27 is a section taken along the line XXVII-XXVII in FIG. 26;

FIG. 28 is a cross section through the beverage bag taken along the line XXVIII-XXVIII in FIG. 26;

FIG. 29 is a front elevational view of the beverage bag of FIG. 26 closed after filling;

FIG. 30 is a section through the bag taken along the line XXX-XXX in FIG. 29;

FIG. 31 is a front elevational view of a modification of the bags of FIGS. 26-30 having bevelled corner edges in the bottom region;

FIG. 32 shows the bottom region of the bag represented in FIG. 31, in an intermediate position before being set up in use;

FIG. 33 shows the bottom region of a bag of FIG. 31 when it is standing;

FIG. 34 is a section through a thermoplastic synthetic plastics film tube with double gussetts;

FIG. 35 is a top plan view schematically

representing the fabrication of the bag of FIG. 31;

FIG. 36 shows, in front elevational view the bags, still connected to each other;

FIG. 37 is a vertical section through one of the bags in FIG. 36;

FIG. 38 is a front elevational view of a finished and filled bag; and

FIG. 39 is a vertical section through a finished and filled bag.

The manufacture of the beverage packaging bag in accordance with FIGS. 1-4 begins with a double gussetted tube of thermoplastic synthetic film, that is, a tube which is provided with bellows-like gussetts on both of its longitudinal edges. By the term "gussetted tube" is also to be understood such tubes as those which originated at the extrusion press as a simple tube lacking gussetts, which however are obtained by a subsequent in-folding operation to form two adjacent double edges. The procedure of FIGS. 1 to 4 is also possible with a tube provided only on one side with a gussett and the opposite side of which can be either open or closed, preferably however being open. The representation of FIGS. 1-3 discloses a method which is particularly advantageously used because two beverage bags are simultaneously prepared side by side.

In FIG. 1 at 11 and 12 are indicated the upper and lower bag walls, the faces of the gussetts being designated by 13 and 14. Only the right half of the bag is provided with reference numerals in these figures and will be described. It is to be understood however that the left half of the tube is simultaneously worked and that the description in reference numerals are likewise applicable thereto.

Starting with the gussetted tube of FIG. 1, as indicated in FIG. 2, the faces 13 and 14 of the gussetts are separated by a cutting knife along their inner fold line.

Thereafter the upper bag wall 11, the lower wall 12 and as well the gussett faces 13 and 14 are welded together by a welded seam 15 in the region adjacent the outer end thereof as shown in FIGS. 3 and 4, or as is also possible on the very outer edge thereof, up to a slot 16 provided for introduction of a drinking straw. This welding 15 represented in FIGS. 3 and 4 is therefore a four-layer welding. Four-layer welding seams 17 and 18 laterally delimit the slot 16 for straw insertion and are convergently directed towards the middle of the bag and do not reach to the inturned interior ends 19 of the cut gussett faces 13 and 14.

Next, the tube of FIGS. 1 and 2 is cut through at the middle by a severing cut 20 FIG. 3 and then transverse weldings 21 FIG. 4 are made. These transverse welds are produced intermittently, that is, a trans-

verse weld is made for each respective advance of the tube by the width of a bag. The bag is filled with liquid, milk for example, at the open end 22 and then after filling is closed in known manner, as by weld seaming. In the filled bag the faces 13 and 14 at the gussetts lie tight against one another, so that escape of the liquid through the drinking straw slot 16 is prevented, and thereby constitute a check valve. With sufficiently dimensioned contact surfaces of the gussett faces 13 and 14, the weld-seams 17 and 18 can be omitted.

In FIG. 5, in accordance with the invention, again the fabrication begins with a gussetted tube, and next the film sides which provide the bag walls 11 and 12, are lifted away from each other, so that by means of a suitable work tool a joining of the faces of the gussett faces 13 and 14 can be obtained. This union can result in the production of welding seams 23 and 24 disposed as in FIG. 7, which unite the gussett faces 13 and 14, and which again advantageously laterally delimit the straw insertion opening and converge towards the middle of the bag. In FIGS. 6 and 7, the inner intumed end 25 of the gussett faces 13 and 14 is not cut off along the entire length, but rather in the straw opening region only there is a cut 26 which is arcuate in the construction of FIG. 7 but which also can be straight.

Alternatively adhesion of the opposed gussett faces 13 and 14 can be obtained through rolls 27 and 28 which are applied to opposite sides of the faces 13 and 14 and by use of heat and pressure achieve an adherence of these faces. This is shown merely schematically in FIG. 6. The adherence is then advantageously produced over the entire surface of the faces 13 and 14, and the inner intumed end 25 is then cut along the entire face. An adherence of the opposed surfaces of the gussett faces 13 and 14 can also be produced by an adhesive or other operation, which units the opposed faces with an adhesion of such degree that, upon introduction of a drinking straw through the slot 16, as represented in FIG. 4 and in FIG. 9, these faces are separated, but at the same time an escape of liquid from the bag through the slot 16 is prevented, since the opposed surfaces of the gussett faces 13 and 14 lie against each other in a liquid-tight manner.

It is also possible corresponding to the proposal of FIG. 6 to apply to opposite sides of the faces 13 and 14 pressure rolls which have a rough surface and "mill" or indent the face parts together, so that they are interlocked, knurled or indented into each other, and thereby produce a liquid-tight arrangement, which however upon introduction of the drinking straw is freed

at the point of and in the region of the place of insertion.

Next, the film walls 11 and 12, which later provide the bag walls, are again laid flat, and the four-layer weld 15 is made with the slot 16 present in what will later be the bag center for introduction of the drinking straw, as already described in FIGS. 1-4. Then, in the manner already described, there follows the transverse welding for finishing the bag, which in FIG. 9 is also open at one side.

FIG. 9 shows the top plan view of a finished bag. In stippled lines are represented the weld-seams 23 and 24 which weld only the gussett faces 13 and 14 to each other. The uncut part of the intumed end of the gussett faces 13 and 14 is designated 25, while here again the cut part in the region of the straw insertion opening is presented at 26.

In FIG. 10, fabrication again starts with a tube 10 of such width that two bags are made in one working operation. The tube having the walls 11 and 12 is printed in known manner and has the printed fields 28 and 29 which are located for a respective bag. Through rolls or like folding devices 30, 31, the edges of the tube 10 are folded inwardly so that the aforescribed gussetts 13 and 14 result. Next the tube 10 is slit completely along its middle by a knife 32 and in the cut slit, there is inserted a rod 33 having outwardly extending arms 34, 34a, 34b and 34c disposed in the tube transversely to its direction of motion, to the ends of which arms are attached the Teflon (Registered Trade Mark) flaps or vanes 35, 35a, 35b and 35c. These vanes in a simple manner permit the welding of the gussett faces 13 and 14 to one another exclusively without any effect on the bag walls 11 and 12, because in accordance with FIG. 12, the vanes 35a attached to the arm 34a is disposed between the face of the bag wall 11 and gussett face 13, and the vane 35c on the arm 34c is disposed between the gussett face 14 and the bag wall 12, so that a welding device gripping the parts from the outside in a pincers-like manner welds the gussett faces 13 and 14 to one another, but not however, the side walls 11 and 12. The outwardly extending arms with the vanes are stationary, while the tube 10 is continually or intermittently advanced in the direction of the arrow 36 for bag preparation.

In accordance with the embodiment in FIG. 10, in the aforescribed manner there are produced for uniting the gussett faces 13 and 14, two adjacent welding seams 37, 37a so spaced that a drinking straw can be correctly and easily introducible into the finished bag.

Next, on each tube half the side edge

weld 38 is made, followed by the transverse welding to produce a finished bag, and finally the severance thereof from the tube by side seam welding, i.e., by cutting down the centre of one welding seam to produce two welding seams. Basically, there are present two adjacent seam welds and a separating seam lying therebetween. In the embodiment in FIG. 10 the operations are carried out with the side seam welding operation in which however in one working step four weld seams 39, 39a, 39b and 39c are produced with a severing cut between the welded seams 39a and 39b. Thereby there are obtained at both sides of a bag the pockets represented in detail in FIG. 16.

In the representation of FIG. 10 there results no cutting of the fold lying between the bag walls 11 and 12 along the edge 40 of the gussett faces 13 and 14, because the cutting at 42 for insertion of the drinking straw 41 in the finished, filled and completely closed bag is attained by the drinking straw 41 itself, which has a rigidity and also hardness for that purpose and particularly is pointed at its forward end. The drinking straw advantageously is comprised of synthetic plastics, because such material when used for such straws has the desired properties.

FIGS. 13 and 14 show that the invention can be carried out in simple manner when the process begins not with a gussetted tube or a tube converted into a gussetted tube, but rather with two tube webs 11 and 12, between which are inserted the gussett faces 13 and 14, comprising a folded band or strip, as schematically represented in FIG. 14. The separate filling opening is not shown in FIGS. 13 and 14.

To facilitate insertion of the drinking straw 41 in the associated passage in, accordance with FIG. 15 it is proposed that there be a projection edge on the straw and consequently a gussett face 14 of greater width than the gussett face 13. This feature is hereinafter explained in further detail.

In accordance with FIG. 16 a beverage bag has on the longitudinal edges respective pockets, which are obtained insofar as four weld seams are made as in FIG. 10 with a separating cut between the weld seams 39a and 39b. It is also possible to do without the pockets. Also, the welding seams 39b and 39a need not be very strong. The bag in accordance with FIG. 16 has a base which is obtained in simple manner from a gussett, that is, deviating from the description of the fabrication method of FIG. 10, two adjacent bags are not produced but rather only a single bag, the gussett on this side of the tube being used for the base.

Also, with the bag fabricated in accordance with FIG. 16 there results a penetration of the gussett faces 13 and 14 in the

region of the insertion opening for the drinking straw 41 by the straw itself at the location 42. Further, the bag in FIG. 16 shows that for formation of the straw insertion opening only a single welding 37 of the gussett faces 13 and 14 is made, because this is laterally displaced and lies in the region of the weld seam 39c. Further, there is also present a notch or gap 43 through the walls 11 and 12 in the upper region of the bag acting as a slit for tearing the bag open when the contents are to be poured rather than removed through a drinking straw.

In accordance with FIGS. 17 and 18 the fabrication again starts with a double gussetted tube and on one tube side a four layer weld 15 is made which units the parts 11, 12, 13 and 14, but with this welding seam however interrupted for formation of a straw entrance 16. The inner intumed end 25 of the gussett faces 13 and 14 remains closed and is only pierced by the drinking straw. Also, the gussett faces 13 and 14 are in no way united, except by the aforementioned welding 15. Next, the side seam welding is made, comprising the weld seams 39a and 39b, seams 39a and 39b are then separated by cutting therebetween.

By the drinking straw 41 of sufficient rigidity, which is advantageously also pointed at its forward end, perforates the intumed end 25 of the gussett faces 13 and 14 lying between the bag walls, and upon withdrawal of the straw 41 the perforation again closes itself, so that the beverage bag remains liquid tight. In FIGS. 20 and 21 for purposes of disclosure, the gussett faces 13 and 14 are shown but not represented lying in contact in FIG. 21.

In FIGS. 16-21, the separate filling opening is not shown, although it is to be understood that it is provided at the bottom or other end of the bag as in the case of FIG. 4.

In FIGS. 22 to 29, again the fabrication of the beverage bag starts with a double gussetted tube 10. While the gussett faces on the left side of the tube have equal width, on the other side the gussett faces 13 and 14 have unequal widths so that the tube walls 11 and 12 also have unequal widths. Next, the tube is continually slit along the fold line 44 by a blade 45 so that, as is seen from FIG. 24, the gussett face 14 is separated from the bag wall 12.

At a subsequent work station, a weld-preventing Teflon (Registered Trade Mark) web blade or vane 47 is introduced on a rod 46 between the gussett-face 14 and the tube wall 12, so that at the upper edge of the shorter bag wall 11 a three-layer welding 15 can take place uniting the wall 11, the gussett face 13 and the gussett face 14 with one another. Welding of the gussett face 14 with the bag wall 12 is prevented by the Teflon web. This is not a continuous

weld, but advantageously there remains, in what is later at the centre of the bag, a slot 16 for introduction of a drinking straw 41 represented in FIG. 28 and hereinafter described.

At a subsequent work station there are made the two transverse welds 39a, 39b with the separating cut 56 (see FIG. 22) lying there between, which weld together the bag walls 11 and 12 and also on both margins the gussett faces 13 and 14. In FIG. 22 for purposes of clearer overall representation, not all the welds 15 are shown. In practice, the welds 15 are formed in succession, one welding 15 following another. Here it is to be noted that the slot 16 represents a gap or interruption of the weld seam 15, which is obtainable in a simple fashion with a recess in the face of the welding jaw element.

FIG. 26 shows in front elevation a beverage bag ready for filling. It is seen from the cross-section in FIG. 27 that a filling opening extending over the entire width of the bag is provided by the cut at 44; and from FIG. 22, that the weld 15 connects the shorter bag wall 11 with the gussett faces 13 and 14 up to the aforementioned gap 16. Through the latter can be introduced the drinking straw 41, comprised of synthetic plastics of sufficient hardness and pointed at its lower end, so that it penetrates the intumed end 25 between the gussett faces 13 and 14 for opening of the filled bag.

FIG. 29 in conjunction with FIG. 30 shows that for closing of the liquid filled bag the gussett face 14 is united with the bag wall 12 by a weld 47. There is involved a two-layer welding, which is easily carried out.

FIG. 31 shows a bag having a filling opening and bag closure corresponding to the arrangement represented in FIGS. 26-30, only here the base of the bag is not formed by a gussett. In order that the bag will stand on a flat surface and be stable the corners of the lower edges of the bag are bevelled, the bevelling advantageously having an angle of 35 degrees with the longitudinal bag edges. As a result thereof, if a filled bag is placed on a table, the bevels 48, about their middle part, fold inwardly, whilst with a standing bag, as shown in FIG. 33, the bevels tend to completely fold closer together so that a self standing bag is obtained.

In accordance with the invention it is further possible in a single working procedure to fabricate two adjacent standable bags from a tube having gussetts located on both longitudinal edges as shown in FIG. 34.

FIG. 10 shows that from a single tube two bags likewise can be simultaneously fabricated in a single working procedure, but these however do not have a distinct base.

In the working method of FIGS. 23-30, a bag with base faces is indeed obtained but there only one bag can be fabricated from a single tube width.

FIG. 35 in contrast shows the possibility of making in a single working step and from one tube a bag having a sufficient base surface so that the filled bag can stand with sufficient stability.

First, in the middle of the tube a cut 49 FIG. 35 is produced and a parallelogram is punched out. This punched opening and the cut 49 may be made with a heated blade, which is easily yieldably flexed in the direction of its insertion. Next, with an advance of the tube in the arrow-indicated direction 51, in a slight lateral spacing from and on both sides of the cut 49 there is made a weld 52 and also around the parallelogram a weld 53. Thereby the bag walls 11 and 12 are welded along their bases, and on the bevels, with four bags being welded in one working step, although as FIG. 35 shows only over one half. In FIG. 35, the previous weldings 52 and 53 are represented in dashed lines. It is also possible to produce the separating cut 49 and the stamping of the parallelogram simultaneously with the welding 53 and 52 in one working step. For the purposes of clarity however these two stages are represented and described one after the other.

Further, in FIG. 35 for the purpose of simplified representation, the weld 15 and also a transverse welds at 39 are not represented, although there does not appear the severing cut between the transverse weld for separation of the finished bag.

In FIGS. 36-39 is shown the further proposal in accordance with the invention of not separating the beverage bags from one another after their production, but rather to leave them attached, so that a belt or a chain of connected bags can be introduced into a filling apparatus.

It is also possible, after preparation of the attached bags to wind them into a supply roll and to introduce this supply roll in a filling machine. It also lies within the scope of the invention to combine apparatus for the fabrication of the beverage with a filling apparatus.

To attain this, it is proposed that the transverse welds do not extend over the entire bag height, but that these terminate shortly beyond the fold line 54 of the short side fold 13 with the short bag wall 11. Thereby, as shown particularly in FIG. 37, there is obtained between the bag wall 12 and the side fold 12 and the side fold 14, a continuous channel 55 uninterrupted by transverse welds. In this channel there is disposed the stationery filling head 57 for the liquid to be contained in the bag, while the attached bags are moved in the direc-

tion indicated by the arrow 58. After filling of an individual bag, the bag opening is closed by a weld 47 FIG. 39 and finally the bags are then separated from one another.

5 The separation of the bags can be achieved by locating a perforation line 56 between the transverse welds 39a and 39b. Then for separation of the filled bag, only a tug need to be applied to it. The separation, however, can also be obtained by a
10 vertically disposed separation knife which cuts between the transverse welds 39a and 39b.

FIG. 38 shows in vertical front elevation
15 a filled bag which corresponds to the bag represented in FIG. 29 except for the difference that the transverse weld 39 does not reach to the upper bag edge. FIG. 39 shows in section the filled bag which corresponds to the bag of FIG. 30 except for
20 the aforementioned modification that the transverse weld does not run to the upper bag edge and also, correspondingly, the weld 47 for bag closure lies at a suitable spacing
25 beneath the upper bag edge.

In the drawings it is to be understood that for clarity of representation, the flat sides 11, 12 of the tubular film stock, from which the main wall portions of the bags result,
30 are shown well separated; and so also, at the inward folds on each edge of the work-piece, the minor film portions or inner fold walls 13, 14 are markedly separated, even though the latter would be in substantially
35 complete contact when joined as by the gapped seam welding 15 made longitudinally of the tubular film work-piece along the line spaced from the longitudinal inner fold edge 19, 25 or 40 in the various figures.
40 Thus also the region of joining by the seam 15 is shown as though a structure is there inserted spacing the joined film faces, although these are essentially in contact and fused to each other at such seams, as are
45 easily made with polyethylene or polyvinyl type films for example.

WHAT WE CLAIM IS:—

1. A beverage bag of thermoplastic synthetic plastic film, which is adapted to be
50 emptied by means of a drinking straw, wherein the bag is fabricated starting with a gussetted tube of thermoplastic sheet material, and in which the drinking straw is introduced into the bag between the faces
55 of the gussett, the said faces of the gussett being welded together except at that part which forms an insertion opening through which a drinking straw can be inserted and, extending over the width of the bag, there
60 is an opening through which the bag is filled to be closed by welding after the filling of the bag.

2. A beverage bag as claimed in claim 1, also having a notch formed through the
65 bag walls and gussett faces in the region of

the insertion opening.

3. A beverage bag as claimed in claim 1, wherein the bag has only one gussett at the top side thereof, its other end either being
70 closed or opened for filling the bag.

4. A beverage bag as claimed in Claim 1, wherein the bag is cut along a fold line joining one bag wall with a face of the gussett so as to separate the one gussett face from the one wall of the bag, the other
75 wall of the bag being welded to the faces of the gussett.

5. A beverage bag as claimed, in claim 1, wherein the bag walls and the gussett faces are welded together in a four layer
80 weld adjacent the top of the bag up to the insertion opening.

6. A beverage bag as claimed in claims 1 or 4, wherein the gussett faces and therefore also the bag walls have unequal lengths, 85 and adjacent the fold joining the shorter gussett face to the shorter bag wall both gussett faces are welded to this shorter wall up to the insertion entry, the longer and projecting gussett face of the tube 90 along its fold line with the longer bag wall being cut to provide the filling opening which after filling is closed by means of a weld.

7. A beverage bag as claimed in claim 4, 95 in which the entry for the straw is located midway along the bag top.

8. A beverage bag as claimed in claim 1 or any of claims 5 to 7, wherein on one or both longitudinal edges thereof there is provided a pocket, which is formed by two
100 respective adjacent welds.

9. A beverage bag as claimed in claims 1-4 or claims 5-8, wherein in the region of the bag bottom, the corners of the bag's
105 bottom are bevelled.

10. A beverage bag as claimed in claim 9, wherein the bevel has an angle preferably of 35° with the adjacent longitudinal edge
110 of the bag.

11. A beverage bag as herein described with reference to Figures 29-30 of the accompanying drawings.

12. A method for preparing a beverage bag claimed in any one of the preceding
115 claims, wherein the starting material is a side gussetted tube, and next adjacent the side edge of the tube, the gussett faces and the tube walls and therefore four layers are welded together up to an opening defining
120 a passage for insertion of a drinking straw and thereafter transverse welds are made to the tube to define the bag.

13. A method as claimed in claim 12 wherein the starting material is a flat tube
125 having on both longitudinal side edges gussetts and the welding of the gussett faces with the tube walls is simultaneously produced on both sides, and the tube is separated by cutting longitudinally down the
130

centre before the transverse welding.

14. A method as claimed in claim 12, wherein additionally to the welding (four layer weld) of the gussett faces to the tube walls running longitudinally adjacent the side edges of the tube, at both sides of the opening, there are two four layer welds, arranged transversely of the aforementioned longitudinal welding, to define the passage preferably converging towards each other in the direction of the centre of the tube but not extending up to the inner end of the gussetts.

15. A method as claimed in claim 12, wherein previously to the welding of the tube walls to the gussett faces parallel to the longitudinal side edge of the tube, the opposed surfaces of the gussett faces are united to one another.

16. A method as claimed in claim 15, wherein the union of the opposed surfaces of the gussett faces is attained by pressing them together over the entire surface by the application of heat and pressure and the union is such that under the action of an inserted drinking straw, these become separated at the place of its insertion.

17. A method as claimed in claim 15, wherein the union of the opposed surfaces of the gussett faces is obtained by welding at limited areas on each side of the opening for insertion of the drinking straw.

18. A method as claimed in claim 12, wherein the union of the opposed faces of the gussett faces is obtained by a knurling (milling), resulting in indentation or hooking of the opposed surfaces.

19. A method as claimed in any of claims 16, 17 or 18, wherein starting with a flat tube, the two tube side edges are formed into gussetts, then the tube is slit mid-way.

20. A method for preparing a beverage bag claimed in any one of claims 1 to 11, wherein the starting material is a side gussetted tube, and next adjacent the side edge of the tube, the gussett faces and a tube wall and therefore three layers are welded together leaving an opening between the gussett faces defining a passage for insertion of a drinking straw and thereafter transverse welds are made to the tube.

21. A method for preparing a beverage bag as claimed in claim 20, wherein the faces of the gussett in one tube side and therefore the tube walls have unequal widths, the longer tube wall is cut along its fold joining it to the wider gussett face and thereafter adjacent the top of the tube, the narrower tube wall with its smaller gussett face and the wider gussett face are welded to each other up to the opening for the drinking straw, preferably where the centre of the bag is to be, then transverse

welds are made to define the sides of the finished bag and for its separation from the tube, next the finished bag is filled with liquid through the opening between the wider gussett face and the longer bag wall, and after filling of the bag the wider gussett face and the longer bag wall are united at the top of the bag by a weld.

22. A method as claimed in claim 20 for preparing a beverage bag as claimed in claim 9 or 10, utilizing a flat tube of thermoplastic synthetic plastics films, having gussetts disposed along both its longitudinal edges whose faces are of unequal width, and wherein the gussett faces are welded together up to the insertion opening, the tube being separated mid-way thereof by a separating cut and next a parallelogram shaped opening (50) is punched out therefrom with the separating cut running diagonally across it, and that at both sides of the cut and around the parallelogram shaped opening and at a slight spacing therefrom there is applied a weld (53) and thereafter transverse welds (39) are made, which separate the parallelogram shaped opening in the middle thereof and which define the bag.

23. A method for preparing and filling beverage bags as claimed in the preceding claims 20-22, which includes the step wherein finished bags unseparated from one another are introduced into a filling apparatus where the bags are filled and after filling, the bags are respectively closed and finally the filled bags are separated from one another.

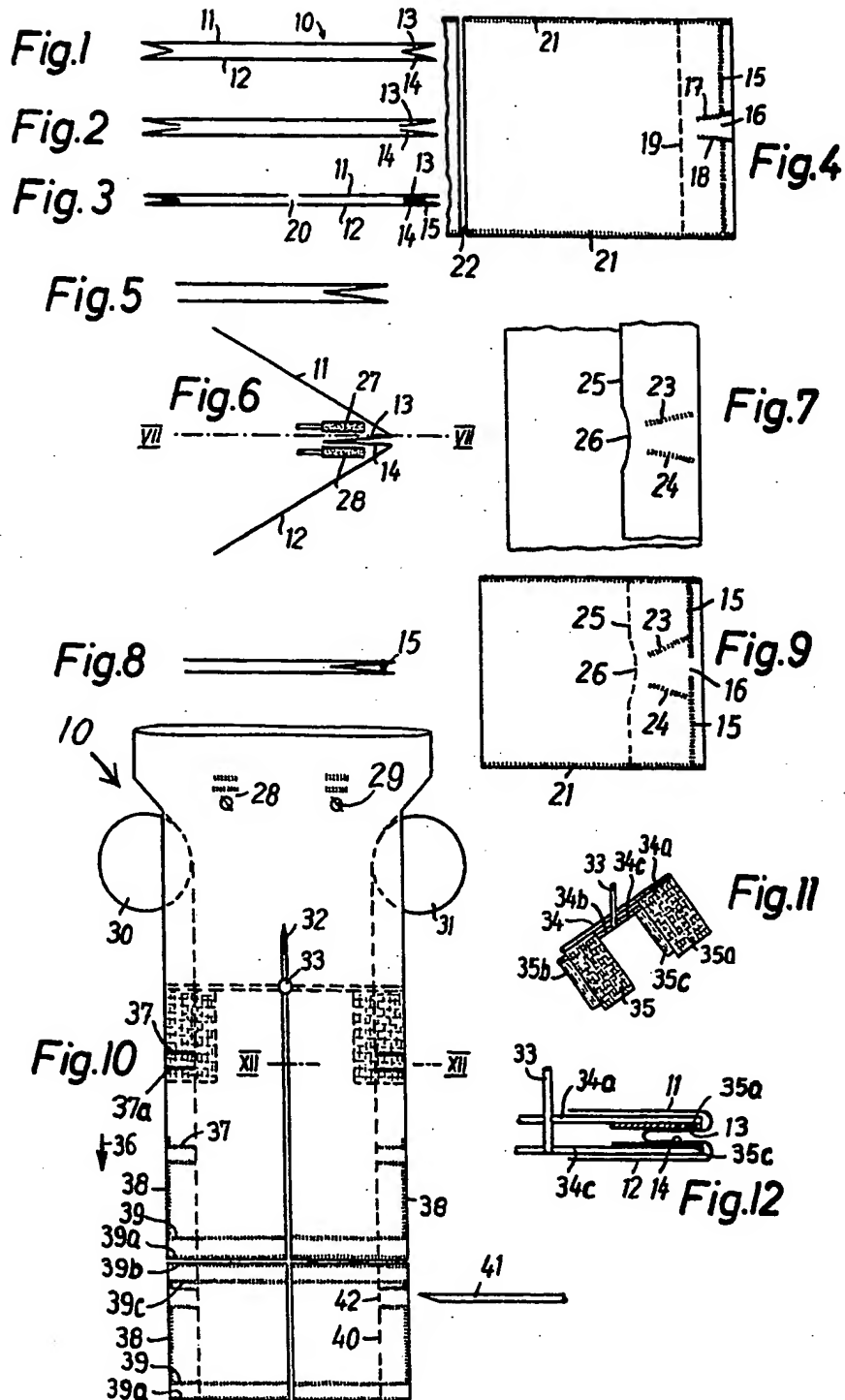
24. A method for preparing and filling of beverage bags as claimed in claim 23 when dependent on claim 21 or 22 wherein the transverse welds do not extend over the entire bag width, but end above the fold line joining the short bag wall to its adjacent gussett face, and consequently in the unseparated bags the wider gussett face and the longer bag wall at their upper end form a continuous channel uninterrupted by transverse welds and in which is disposed a filling head for the liquid with which the bags are filled.

25. A method for preparing and filling beverage bags as claimed in claim 23 or 24 wherein a double transverse weld (39a, 39b) defines the bags between the welds of which there is a perforation (56) which permits separation of the bags.

26. Beverage bags when constructed and arranged, as substantially described with reference to the accompanying drawings.

27. A method for preparing and filling beverage bags as claimed in claim 12-25 substantially as herein described.

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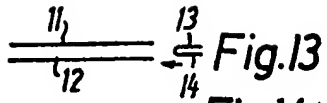


Fig. 13

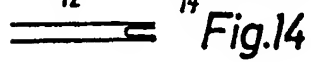


Fig. 14

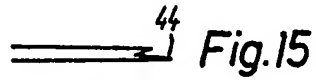


Fig. 15

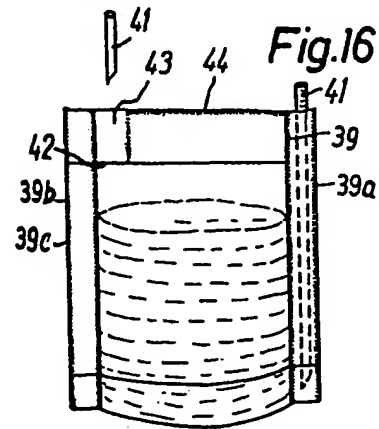


Fig. 16

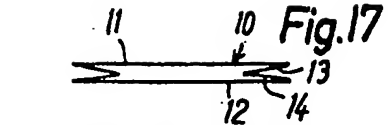


Fig. 17

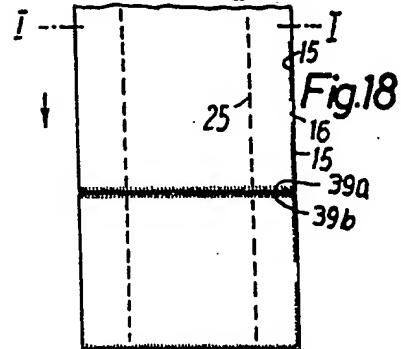


Fig. 18

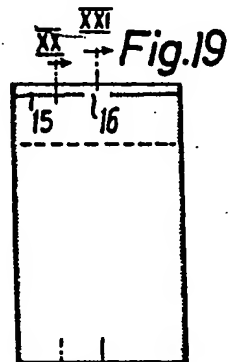


Fig. 19



Fig. 20

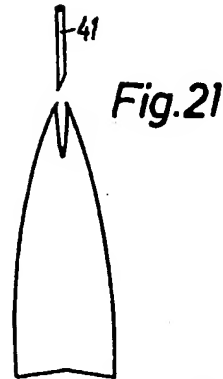


Fig. 21



Fig. 23

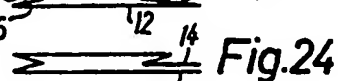


Fig. 24

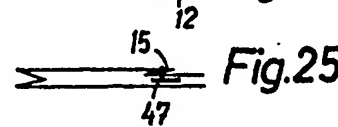


Fig. 25

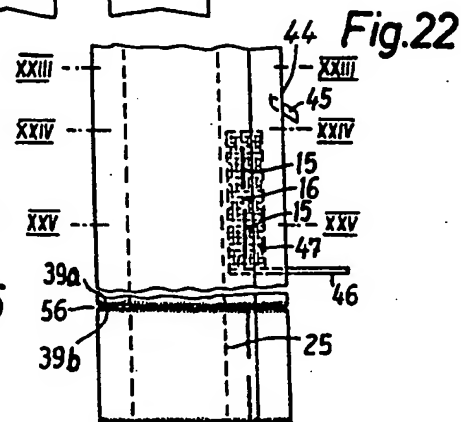


Fig. 22

